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DAKOTA ZEPHYR

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Dear Cooperator: * * * * * * * * *

SPREADER FURROWS NEAR FAITH HOLD WATER WHERE IT FALLS; SOAKS 24 INCHES

Some interesting results have been observed on a small water spreader system constructed by Ed Hall, 8 miles northwest of Faith, in the Tri-County Soil Conservation District.

The small spreader furrows were surveyed by the Soil Conservation Service and constructed by Mr. Hall himself to intercept run-off water from old cattle trails below hardpan spots. Water was retained where it was needed, that otherwise would not have stayed on the slope. After a rain, an examination of the furrows showed that moisture had penetrated to a depth of 24 inches. On the same slope, where there were no furrows, the moisture had gone down only 12 to 15 inches.

An eventually stimulated vegetative growth will be noted in this area, because of the additional moisture conserved by the furrows. As a result of the success of these water spreader furrows, additional furrows were run and Mr. Hall plowed them out. "Water conservation pays," he observed.

PLANTING TREES AND PROPER MANAGEMENT OF WOODLANDS IMPORTANT IN SOIL CONSERVATION WORK

Planting trees and demonstrating the proper method of management for established woodlands constitute an important phase of the erosion control work of the Alcester Soil Conservation Service CCC Camp.

Trees are planted to control large gullies, put to use land that is too steep or otherwise unfit for cultivation, and to protect croplands from hot, dry winds.

Since 1936, 201,000 trees and shrubs have been planted in gullies, 184,000 in windbreaks and 452,000 in old woodlands and around lakes in the Alcester camp area.

In many gullies, the trees have checked any further erosion, and the gullies are beginning to fill up. As some of the trees planted in windbreaks in 1936 are now nearly 20 feet tall, they are already effective in reducing wind velocities, thus causing a check of wind erosion in their protective area.

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BIGGER LIST

This issue of the Dakota Zephyr newsletter is being mailed to a larger group of people in South Dakota than any other issue. The farmers and ranchers living in the soil conservation districts have been added to the mailing list, as are new cooperators in the project and camp areas. This publication is now being sent to approximately 3000 conservation minded people.

The Dakota Zephyr newsletter is distributed free of charge and is issued quarterly by the Extension Service, the Soil Conservation Service cooperating. Suggestions for improvements are always welcome and if sent to the Extension Conservationist, Extension Service, Brookings, S. Dak. will be given consideration in the future issues of this newsletter. We shall also be more than pleased to add additional names to the mailing list at any time.

WORK DONE ON 20,414 ACRES IN TRI-COUNTY DISTRICT; MOSTLY PLANNING

Work in the Tri-County District up to July 1, 1938 was limited mostly to planning.

The Soil Conservation Service district office reported, however, that some work had been done on each of the 12 units comprising 20,414 acres, an average of approximately 1,701 acres per unit. Agreements had not been completed because the policy for lending Soil Conservation equipment had only recently been approved.

Regardless of the recent approval of this policy, the Tri-County District has accomplished the following: Topography and contour lines--1000 acres; contour strip farming and contour fallow--700 acres; construction of terraces--3/4 mile--30 acres; construction of 23 guide lines--8 miles--400 acres; planting of 1400 trees on the contour, or approximately 4 acres; laying out of additional 6 acres of trees for 1939; construction of 12 water spreading furrows--1½ miles--40 acres; proposal of 27 dams--22,800 yards--79 acre feet; survey of 3 dams--4000 yards--11 acre feet; survey of 2 water spreading systems (70 acres to be flood irrigated); location of 2 present tree planting sites; proposal of 2 dugouts or stock water holes--3000 yards--2 acre feet.

Range estimates of forage resources have been completed on these 12 units. Range estimates have also been made for forage requirement determination on 1390 acres, and for check vegetation studies on approximately 535 acres. Vegetative base maps, acreage maps, and range estimate sheets for 11 units have been made and forwarded to the Regional Office at Rapid City, for drafting and compilation work.

Results of the range surveys would indicate inadequate range resources on some units for the stock carried; and, in others, the need for a grazing system which would provide for maintenance of an adequate forage cover on all the range land in the units. Plans are being developed to handle these problems. Water development sites, consisting of reservoirs and dugouts, have been tentatively worked out in cooperation with the District engineer.

The conservation surveys have been completed on all of the 12 units, a total of 20,414 acres. The soils problem in the Tri-County District is a

very difficult one. To date, 29 soils types have been established, and 7 more have been tentatively established. In addition to the conservation surveys, the soils technologists have combined the soils into 9 groups according to suitability and adaptability for the best land use. This grouping is made to simplify the conservation survey for interpretation by the farmers and ranchers and is called a "land conservation map".

The field work on the economic survey, conducted by the Bureau of Agricultural Economics, Land Utilization Section, has been completed, and the summarization has been started.

700 ACRES TERRACED FIVE INCH RAIN SOAKS INTO GROUND WITHOUT WASHING

Approximately seven hundred acres have been terraced in the Alcester area and all the cooperating farmers are well pleased with the results.

All terraces in this area are of the broad base type, and may be farmed without any trouble. This type of terrace may be constructed with a regular farm tractor, if a farmer so desires.

Contour farming, which is always practiced, with terracing slows up the movement of water, thereby giving it more time to soak into the ground. The more water that soaks into the ground, the less has to be disposed of at the terrace outlet.

On July 1, 1938, approximately five inches of rain fell on the Ray Fletcher farm near Akron, Iowa. There was very little soil washing on this farm, whereas, on other farms, serious washing was to be seen on every side. Mr. Fletcher has approximately sixty acres of steep slopes already terraced, with almost thirty acres of terraces to be constructed in the near future.

HAWARDEN FARMERS FIND STRIP CROPPING SIMPLIFIES FARMING: HAS LONGER ROUNDS

In the fall of 1937, J. B. Schiefen, Hawarden, Iowa, signed a cooperative agreement with the Soil Conservation Service CCC camp No. 3 at Alcester, South Dakota.

Mr. Schiefen's land is situated in the bluffs along the Sioux River valley in Union County, South Dakota. The slopes on cultivated land vary from 1 percent to 13 percent, and erosion has removed up to 75 percent of the topsoil on the steeper slopes. Gully erosion also has resulted in several large cuts through his fields.

In the early spring of 1938, guide lines were laid out for strip cropping with alfalfa buffers. The width of the strips range from 120 to 150 feet, to allow for a better land use. Alfalfa was seeded alone in the buffers early in April, at the rate of 10 pounds per acre. An excellent stand of hay was obtained. The first cutting was made early in July. The strips were planted to corn and small grain.

Mr. Schiefen reported that the new arrangement of fields makes it much easier to farm, as the contour strips provide longer rounds and plowing on the contour is easier on the horses than working up and down hill. Under the present system, there are no point rows to work out; and the gullies, which were too deep to be crossed with farm machinery, are rapidly being filled in by use of brush dams.

During the season, there have been several hard rains of more than an inch in intensity which caused some soil loss from the strips, but this loss was negligible as compared to the removal resulting from up and down hill cultivation.

STUDY MOISTURE PENETRATION TO DETERMINE VALUE OF PASTURE CONTOUR FURROWS

Cooperative moisture penetration studies with the SCS and State Experiment Station were started this spring on several pastures in the Wolsey-Shue Creek Demonstration area, to determine the value of contour pasture furrows in storing moisture in the subsoil.

In each of three pastures, the depth of moisture was measured, at periodic intervals, in the furrow, 2 feet above the furrow, 2 feet below the furrow and half way between the furrows. These values were then compared to a check plot of nearby pastures of the same soil, slope and cover but not contour furrowed.

The average results of moisture penetration obtained on the three pastures were as follows:

In the furrow - 32.2 inches
2 feet above furrow - 22.1 inches
2 feet below furrow - 24.3 inches
Half way between furrows - 15.8 inches
Average of furrowed pasture - 19.1 inches
Check plot (not furrowed) - 19.1 inches

The above results show that an average of 5 more inches of moisture penetration was obtained by the effect of contour pasture furrows on the pastures studied.

The added grass growth on the three pastures studied shows the beneficial effects of the additional moisture retained by the furrows.

At the present time similar intensive studies are being made to determine the increase of subsoil moisture obtained by various water conservation practices.

WOODLAND PLANTINGS IN WINNER-DIXON AREA, WITH CARE, HAVE GOOD SURVIVAL

Since the spring of 1938, the growth of woodland plantings of Soil Conservation Service cooperators in the Winner-Dixon project area, including numerous varieties of trees and shrubs, has been very encouraging.

"The farmers have taken an active interest in caring for their plantings and in cultivating and keeping them free from weeds, by hoeing and power cultivation," the Service says. "This care is reflected in accelerated growth by the trees. In some cases, the cottonwoods have grown 8 feet in a year's time. However, the average growth over the entire area is from 1 to 3 feet. The best growth is always found on clean sites; and, in general, damage from grasshoppers is less serious on plantings that are free from weeds."

Survival of trees and shrubs planted in 1937, as they were checked in October 1937 may be seen from the following table:

Species	Percent Survival
False indigo	85
Green ash	83
Hackberry	82
Chokecherry	81
American elm	78
Chinese elm (Ulmus pumila)	63
Caragana (Siberian pea)	60
Chinese elm (Ulmus parvifolia)	54
Wild plum	48
Black locust	46
Cottonwood	30

These survival percentages were influenced by the relative condition of the original planting stock and by the care given by different cooperators.

Considerable loss is experienced from insect damage, especially grass-

hopper. Grasshoppers prefer the Caragana (Siberian pea) to any other species commonly planted, and most of these shrubs are seriously defoliated at this time. The Caragana, however, seems to have the ability to recuperate from this leaf damage and produces three or four new growths of leaves, if necessary. The Russian olive also suffers from 'hopper damage to the leaves but is not able to put out a new growth of leaves as readily as the Caragana. This defoliation by 'hoppers does not seem to be so severe on older Russian olive trees found in the area.

The injuries received by woodland plantings from insects varies a great deal with different localities and different plantings, with some woodland plantings being seriously injured and others hardly touched.

The false indigo, or lead plant, is a relatively new shrub introduced on the project and appears to suffer less damage than any other species. It responds very well to cultivation, and has made a growth of from 3 to 4 feet since it was planted in the spring of 1937.

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WINNER MAN FINDS WATER SPREAD ON PASTURE BY SOIL CONSERVATION SERVICE METHODS IMPROVES GRASS

"Water spreading on grass land with plenty of water for my pasture has been a high-light of my erosion control program," C. F. Spreckels said when interviewed by the Winner project engineer.

Mr. Spreckels is one of the many farmers in the Winner-Dixon area who have claimed benefits from the stock water dams and water spreading structures, especially roadside diversion dams and ditches. These measures have made possible better pasture management as they insure an improved supply of grass during drought periods because of a larger reserve supply of moisture in the soil.

This dam constructed on the Spreckel's pasture contains 46 acre feet of water, which is an ample supply for his livestock at all times. The surplus water is spread through a natural spillway over sixty acres of grassland, through a system of 10,560 feet of furrows.

Terraces in the Winner-Dixon Soil Conservation area have shown definite advantages in controlling water and conserving moisture. The above-normal rainfall experienced this year has demonstrated that water erosion is a serious problem. Considerable sheet erosion and numerous small gullies have developed. On fields that have been terraced, very little water erosion and no gullies have appeared. The run-off has been caught in the terrace channels and allowed to penetrate into the soil as a reserve supply for crops during dry weather.

Excellent results have been obtained in preventing and healing gullies with small rock dams and drops, as by sodding. These small gullies will increase in size at an accelerated rate when exposed to uncontrolled water run-off. They may be controlled easily when small, but the cost of control becomes almost prohibitive when they increase in size.

Mr. Spreckels is cooperating in establishing a complete soil and water conservation plan on his 320-acre pasture.

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Conservation agriculture is essentially "farming for the future." The conservation farmer is keeping a watchful eye on the productivity of his farm for the years that lie ahead.

WOLSEY-SHUE CREEK PROJECT PLANTS 1,043,707 TREES AND SHRUBS FOR SOIL AND MOISTURE CONSERVATION

More than a million trees and shrubs were planted in the spring of 1938 as permanent erosion control structures on farms in the Wolsey-Shue Creek area being operated under erosion control-moisture conservation programs in cooperation with the Huron Soil Conservation Service project.

In 1938 on the project, there were 1,044,643 trees and shrubs planted: 76,221 around dams and reservoirs, 39,871 in single row shrub buffer strips, 94,660 inter and under planted in old woodlots, and 833,891 planted in 5- to 10-rod field windbreaks.

A total of 1,502 acres are now planted and permanently protected from grazing by an adequate fence. They are to be cultivated until the trees attain a growth sufficient to eliminate weed competition, or until the canopy is closed.

In the year 1937, the average survival for hardwood trees was 75 percent. At the end of July, the 1938 plantings showed an average survival of more than 95 percent. Some trees planted in 1937 (just 14 months growth) were 11 feet high at that time. They protect an area 440 feet wide or 20 times their height.

Trees and shrubs planted for soil and moisture conservation serve multiple uses:

1. Reduce wind velocities, erosion and fertility losses.

2. Conserve moisture by lowering wind velocities, thus reducing evaporation, transpiration, and run-off; improve soil moisture absorption and storage.

3. Reduce stock feeding costs, fuel requirements; lessen building repairs and maintenance, furnish wood products and provide homes for wildlife.

4. Provide a more desirable environment for homelife.

The establishment of a tree site on any farm requires careful planning: First, a need to justify the expense must be shown; second, the soil and moisture conditions must be satisfactory; third, the tree site should be located so as to give maximum benefits and to fit in with sound permanent farm management practices; fourth, the area must be fenced to exclude livestock; fifth, the site must be properly prepared; sixth, the proper species and arrangement of species must be determined; seventh, the trees must be properly planted, and, last but not least, the trees must be <u>well</u> taken care of (cultivated) after planting.

Experience shows that survival and growth are directly proportional to the amount of cultivation. Good care means fewer years of cultivation, more trees per acre, quicker returns on the investment, and success for the tree plantings.

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EFFECT OF STRIP CROPPING ON BLOWN LAND SHOWN IN SANDY AREA NORTH OF HURON

The effectiveness of strip cropping in controlling soil losses on badly blown land has been clearly demonstrated in the sandy area a few miles north of Huron. In most cases, the larger part of the land on these farms was blowing severely in the years preceding 1937. It was then that the Soil Conservation Service, through its CCC Camp at Huron, put into use the practice of wind strip cropping to control the blowing on these farms.

In 1937, several of the farms were listed by the cooperators to cane, corn and sudan grass in strips 3 to 5 rods wide, with alternate strips of small grain seeded with a deep furrow drill. The latter strips were also from 3 to 5 rods wide.

Several additional farms have been given the same treatment this season, with very good results reported.

"Strip cropping is all right and certainly the only way to keep this sand from blowing," said Mr. B. A. Lounsbury, farmer living 4 miles north of Huron, when asked what he thought about strip farming. "In 1937 I didn't strip crop and lost 60 out of 100 acres; whereas in 1938, when strip cropping, I didn't lose any of my crop."

Mr. Lounsbury praised the deep furrow drill and duck-foot cultivator in the prevention of wind erosion.

Mr. R.F. Barnett who lives 5 miles northeast of Huron, agrees with Mr. Lounsbury that narrow strips are essential in the prevention of wind erosion on sandy soil.

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TRACTOR AND LISTER WITH DAMMING ATTACHMENTS PUT TO WORK JULY 21

Equipment loaned to the Tri-County District was first put to work on Thursday, July 21, 1938, according to Ben. Fenn, District Conservationist. This equipment consisted of a new rubber-tired tractor and a used lister with damming attachments in good condition.

A small amount of Sooner milo was seeded on each of the farms of George Alt, Frank Gottschalk and George Ulrich. Because of drought and grasshoppers, the seeding was done comparatively late as an effort to grow some supplemental forage crops. The seeding was done on the contour using a lister with damming attachments. By using these attachments, more water will be retained on the field and benefits will be derived next year as well as this year.

"This contouring is the thing," remarked one of the operators. "It makes a world of difference whether you list up and down hill or on the level; and with those little dams in the bottom of the lister furrows, we should be able to hold all the water where it falls," he continued.

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WORK ON ALT FARM BEGINS

Upon request by Mr. George Alt his farm was the first on which work was begun by Soil Conservation Service technicians assisting farmers and Supervisors in the Tri-County Soil Conservation District.

Mr. Alt's farm, southwest of Faith, consists of 1120 acres, of which 267 acres were operated as cropland and the remainder was used for rangeland in 1938. Last year, Mr. Alt contour furrowed approximately 60 acres of rangeland and is observing the possibilities of this practice as a means of soil and water conservation.

He intends to put part of his crop land in on the contour with a deep-furrow drill. In the future, Mr. Alt plans to carry out other conservation practices on his farm.

The district technicians first made necessary surveys and drew up a plan of work for the farm.

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W. R. MATKINS, FORT MEADE, SECURES GOOD WHEAT YIELD ON CONTOURED FIELD

W. R. Matkins had his own proof in 1938 of the value of storing soil moisture for better crop production.

The 80-acres of wheat and summer fallow in one of his fields showed unmistakable benefits of soil and moisture conservation treatment it had undergone in cooperation with the Fort Meade, S. Dak. Soil Conservation Service CCC Camp. In 1937, Matkins put the field in 10-rod contour strips, alternating wheat and fallow. The fallow strips were treated with a duckfoot and were basin listed twice in 1937.

Before seeding this spring, subsoil moisture samples were taken, and the results were: Where wheat followed wheat, there were 18 inches of subsoil moisture; where the field was summer fallowed with a basin lister, the bottom of moisture penetration could not be reached with a 36-inch soil auger. The 1938 spring wheat was seeded with a deep-furrow drill. Moisture samples were taken again in June, and his wheat on the basin listed fallow still showed 18 inches of subsoil moisture; whereas the other field didn't have any.

Matkins credited to the contour listed fallow treatment the rank, even stand that equaled best bottom wheat in the vicinity. His other fields, like other upland spring wheat in the neighborhood that was seeded in 1938 on ground in wheat also in 1937, showed up in harvest the acute need for additional moisture it had had in June to make a good crop. Preliminary yield estimates were 25 bushels for the wheat on the contour strips and from 15 bushels downward on the other land. This season, Matkins contour basin listed the strips that were in wheat in 1937, to store moisture for 1939 crops.

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ALCESTER CAMP WORKING ON WATER EROSION CONTROL: SLOPES RANGE FROM 10 TO 20 PERDENT

The Alcester Camp is composed of white Junior enrollees. These men are working on water erosion control and moisture conservation under the direction and supervision of the Soil Conservation Service technical staff.

The approximate average slope of the Alcester area is 10 percent, ranging from level bottom areas to 20 percent slopes in the uplands. This means that there has been considerable sheet and gully erosion.

The regular farming practice was to plow and cultivate up and down the steep slopes. Due to heavy, washing rains, this method allowed the water to run off, washing the soil and losing both the water and the top soil.

Erosion and water conservation practices used in the Alcester area include terracing, contour farming, contour cropping, woodland planting, brush and wire dams in small gullies, seeding of waterways, stock water dams, diversion ditches, pasture furrows and improved rotations.

In adopting these practices, the farmer changes his methods to going around the hill instead of up and down. The cultivation of fields around the slopes causes ridges to be formed retarding the run-off and preventing soil loss through sheet and gully erosion.

The Soil Conservation Service has ninety cooperative agreements with the farmers under which at least some work is being done; and in a large number of cases, all the land is being farmed on on the contour.

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HURON FARMERS LOOK UPON WATER HOLDING IN PASTURES AS ESSENTIAL OF MANAGEMENT

Water conservation is looked upon by farmers cooperating with one Soil Conservation Service CCC Camp as being the main essential to proper pasture management in the Huron area.

The various structures used to accomplish the much needed conservation of moisture include contour furrows, water spreading dikes, stock water dugouts and stock water dams.

On the M. E. Hanley farm, 10 miles northwest of Huron, there are 320 acres of pasture with three dugouts used to solve the stock watering problem that had been so acute in recent years. In conjunction with the dugouts, contour furrows and water spreading dikes were provided, to utilize the overflow water by spreading it more uniformly over the grass land. This spreading will be a large factor in increasing the vegetative growth and carrying capacity of the pasture.

"We are well pleased with the dugouts and the way they have maintained their water level," Mr. Hanley said. "We feel that the furrows are spaced about right and are responsible for the increased growth of grass in that area."

These furrows are from 12 to 15 feet apart.

In the opinion of farmers in the camp area, such dugouts in a pasture provide adequate stock water, make possible proper distribution of grazing, increase vegetative growth by spreading of overflow water, and conserve water that otherwise would be lost. The cost of construction also is low enough to make it possible for them to have more structures of this kind.

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SUPERVISORS OF TRI-COUNTY DISTRICT RECEIVE RECOGNITION IN WASHINGTON

Supervisors of the Tri-County Soil Conservation District received recognition in Washington, D. C. when they recently executed a Supplemental Memorandum of Understanding whereby the Soil Conservation Service can lend equipment to the District.

In a letter from Ross D. Davies, State Coordinator, to Ben Fenn, District Conservationist, Mr. Davies states that the memoranda from the Tri-County District were the first ones received in Washington, D. C. from the entire United States.

There are 38 soil conservation districts completely organized at the present time and many others are in the process of organization.

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BRUSH DAMS, GRASS STABILIZE GULLIES

An excellent example of gully stabilization can be observed on the farm of Martin Pearson, Alcester, South Dakota, who started his soil conservation farming early in 1936.

In the spring of 1936, a series of brush dams were constructed in several bad gullies. Additional dams were built in the spring of 1938, and the bullies seeded to a mixture of brome grass, alfalfa and sweet clover. The gullies have silted in so that they now can be crossed with farm machinery. A good cover of sweet clover and grass has been established and will be left there permanently to carry the run-off.

Many farmers who are not cooperators in this area are now letting their gullies go back to grass, as a result of the demonstration work carried on cooperating farms.

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UNITED STATES
DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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Brookings, South Dakota

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